IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appellants:	§	Art Unit:	2416
Surya Varanasi	§		
Kung-ling Ko	§	Confirmation No:	9321
	§		
Serial No.: 10/698,851	§	Examiner:	Farah Faroul
	§		
Filed: October 31, 2003	§	Docket No.:	112-0135US
	§		
For: FRAME TRAFFIC BALANCING	§		
ACROSS TRUNK GROUPS	§	Customer No.:	85197

APPEAL BRIEF

Via USPTO EFS **May 19, 2009**

Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450
Mail Stop: Appeal Briefs – Patents

Appellants hereby submit this Appeal Brief in connection with the above-identified application. A Notice of Appeal was filed on March 19, 2009.

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I. REAL PARTY IN INTEREST

Brocade Communications Systems, Inc. is the real party in interest

II. RELATED APPEALS AND INTERFERENCES

Appellants note that an Appeal Brief was filed on June 6, 2008 with regard to commonly owned and related application serial no. 10/699,568 (now U.S. Pat. No. 7,443,799) by Varanasi et al. and entitled "Load Balancing in Core-Edge Configurations," and that an Appeal Brief was also filed on March 2, 2009, with regard to commonly owned and related application serial no. 10/699,567 by Varanasi et al. and entitled "Logical Ports in Trunking." Both applications were subsequently allowed without either appeal being considered by the Board.

III. STATUS OF CLAIMS

Originally filed claims:	1-95.
Added claims:	None.
Claim cancellations:	16, 35, 54 and 73.
Presently pending claims:	1-15, 17-34, 36-53, 55-72 and 74-95.
Presently appealed claims:	1-15, 17-34, 36-53, 55-72 and 74-95.
Presently allowed claims:	None.
Presently objected claims:	None.

IV. STATUS OF AMENDMENTS

Claims 21, 36-39 and 59 were amended subsequent to the Final Office Action of December 23, 2008 (hereinafter "Final Office Action") in Appellants' Response filed February 19, 2009, and the amendments were entered for purposes of this appeal.[1]

[1] *See* Advisory Action dated March 10, 2009 (hereinafter "Advisory Action"), p. 1.

V. SUMMARY OF CLAIMED SUBJECT MATTER

This section provides a concise explanation of the subject matter defined in each of the independent claims involved in the appeal. Each element of the claims is identified with a corresponding reference to the specification and drawings where applicable. Note that the citation to passages in the specification and drawings for each claim element does not imply that the limitations from the specification and drawings should be read into the corresponding claim element.

Embodiments are disclosed according to the presently claimed invention that provide for balancing flow across trunk groups.[2] For example, a method of routing a flow of frames may include receiving at least one frame,[3] selecting an exit port of a switch for the at least one frame to exit based (at least in part) on balancing flow across trunk groups,[4] and transmitting the at least one frame.[5]

In accordance with the invention of independent claim 1, for example, a method of routing a flow of frames through a switch[6] is claimed that includes receiving at least one frame from the flow of frames,[7] applying a process to select an exit port of the switch from a set of possible exit ports[8], and transmitting the at least one frame.[9] At least one frame from the flow of frames exits through the selected exit port to potentially reduce frame traffic congestion along potential routes that include the set of possible exit ports.[10] The set of possible exit ports includes at least some of the exit ports of at least two trunk groups.[11]

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[2] *See* specification of the subject application as published (hereinafter "Specification), Abstract.
[3] *Id.*
[4] *Id.*
[5] *Id.*
[6] *See* Specification, Abstract, and lines 1-6 of ¶ [0046].
[7] *See* Specification, Abstract, lines 6-7 of ¶ [0027], and lines 1-3 of ¶ [0036].
[8] *See* Specification, lines 1-3 of ¶ [0046].
[9] *See* Specification, Abstract, line 6-7 of ¶ [0027], and lines 3-4 of ¶ [0046].
[10] *See* Specification, lines 3-6 of ¶ [0046].
[11] *See* Specification, lines 6-8 of ¶ [0046].

In accordance with the invention of independent claim 21, for example, a switch fabric[12] is claimed that includes at least a first switch and a second switch, the first and the second switch being communicatively coupled.[13] The first switch includes a processor and a memory,[14] and balances a flow of frames exiting the first switch.[15] The first switch further selects an exit port of the first switch from a set of possible exit ports.[16] A frame from the flow of frames exits through the selected exit port to potentially reduce frame traffic congestion along potential routes that include the set of possible exit ports.[17] The set of possible exit ports includes at least some of the exit ports of at least two trunk groups.[18]

In accordance with the invention of independent claim 40, for example, an apparatus is claimed that includes a switch,[19] the switch including a processor and a memory.[20] The switch balances a flow of frames exiting the switch,[21] and further selects an exit port of the switch from a set of possible exit ports.[22] A frame from the flow of frames exits through the selected exit port to potentially reduce frame traffic congestion along potential routes that include the set of possible exit ports.[23] The set of possible exit ports including at least some of the exit ports of at least two trunk groups.[24]

In accordance with the invention of independent claim 59, for example, a network[25] is claimed that includes a host,[26] a physical storage unit,[27] and a first switch and a second switch

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[12] *See* Specification, lines 1-5 of ¶ [0020] and FIG. 1; and lines 15-19 of ¶ [0023].
[13] *See* Specification, lines 1-5 of ¶ [0026] and FIG. 3 (switches 302 and 304).
[14] *See* Specification, lines 1-5 of ¶ [0028] and FIG. 3 (processor 330 and 331; memory 334 and 335).
[15] *See* Specification, lines 1-7 of ¶ [0031]; and lines 1-3 of ¶ [0045].
[16] *See* Specification, lines 1-3 of ¶ [0046].
[17] *See* Specification, lines 3-6 of ¶ [0046].
[18] *See* Specification, lines 6-8 of ¶ [0046].
[19] *See* Specification, lines 1-4 of ¶ [0023] and FIG. 2.
[20] *See* Specification, lines 4-7 of ¶ [0023] and FIG. 2 (control processor 290, RAM 270 and flash memory 265); and lines 1-5 of ¶ [0028] and FIG. 3 (processor 330 and 331; memory 334 and 335).
[21] *See* Specification, lines 1-7 of ¶ [0031]; and lines 1-3 of ¶ [0045].
[22] *See* Specification, lines 1-3 of ¶ [0046].
[23] *See* Specification, lines 3-6 of ¶ [0046].
[24] *See* Specification, lines 6-8 of ¶ [0046].
[25] *See* Specification, lines 1-3 of ¶ [0019] and FIG. 1.
[26] *See* Specification, lines 7-9 of ¶ [0019]; and lines 9-11 of ¶ [0020] and FIG. 1 (devices 120, 122 and 124).
[27] *Id.*

communicatively coupled to form a switch fabric.[28] The first and second switches are further communicatively coupled to the host and the physical storage unit.[29] At least the first switch includes a processor and memory,[30] and balances a flow of frames exiting the first switch.[31] The first switch selects an exit port of the first switch from a set of possible exit ports.[32] A frame from the flow of frames exits through the selected exit port to potentially reduce frame traffic congestion along potential routes that include the set of possible exit ports.[33] The set of possible exit ports including at least some of the exit ports of at least two trunk groups.[34]

In accordance with the invention of independent claim 78, for example, a computer-readable storage medium is claimed that has stored thereon computer-executable instructions[35] that, when executed, result in performance of a method of balancing a flow of frames exiting a switch[36] that includes applying a process to select an exit port of the switch from a set of possible exit ports.[37] A frame from the flow of frames exits through the selected exit port to potentially reduce frame traffic congestion along potential routes that include the set of possible exit ports.[38] The set of possible exit ports including at least some of the exit ports of at least two trunk groups.[39]

In accordance with the invention of independent claim 92, for example, a computer-readable storage medium is claimed that has stored thereon computer-executable instructions[40] that, when executed, result of a method of initializing a switch[41] to route a flow of frames[42] that

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[28] *See* Specification, lines 1-2 of ¶ [0020] and FIG. 1 (Fabric 110); and lines 1-3 of ¶ [0021].
[29] *See* Specification, lines 9-13 of ¶ [0020] and FIG. 1; and lines 1-3 of ¶ [0021].
[30] *See* Specification, lines 4-7 of ¶ [0023] and FIG. 2 (control processor 290, RAM 270 and flash memory 265); and lines 1-5 of ¶ [0028] and FIG. 3 (processor 330 and 331; memory 334 and 335).
[31] *See* Specification, lines 1-7 of ¶ [0031]; and lines 1-3 of ¶ [0045].
[32] *See* Specification, lines 1-3 of ¶ [0046].
[33] *See* Specification, lines 3-6 of ¶ [0046].
[34] *See* Specification, lines 6-8 of ¶ [0046].
[35] *See* Specification, lines 13-23 of ¶ [0060].
[36] *See* Specification, lines 1-7 of ¶ [0031]; and lines 1-3 of ¶ [0045].
[37] *See* Specification, lines 1-3 of ¶ [0046].
[38] *See* Specification, lines 3-6 of ¶ [0046].
[39] *See* Specification, lines 6-8 of ¶ [0046].
[40] *See* Specification, lines 13-23 of ¶ [0060].
[41] *See* Specification, lines 10-13 of ¶ [0060].
[42] *See* Specification, Abstract, and lines 1-6 of ¶ [0046].

includes initializing the switch[43] to apply a process to select an exit port of the switch from a set of possible exit ports.[44] A frame from the flow of frames exits through the selected exit port to potentially reduce frame traffic congestion along potential routes that include the set of possible exit ports.[45] The set of possible exit ports including at least some of the exit ports of at least two trunk groups.[46]

[43] *See* Specification, lines 10-13 of ¶ [0060].
[44] *See* Specification, lines 1-3 of ¶ [0046].
[45] *See* Specification, lines 3-6 of ¶ [0046].
[46] *See* Specification, lines 6-8 of ¶ [0046].

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

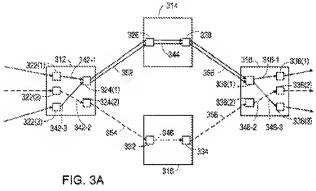
- Whether claims 1-15, 21-34, 40-53, 59-72, 78-87 and 92-95 are obvious over Valdevit et al. (U.S. Pat. App. Pub. No. 2002/0156918, hereinafter "Valdevit") in view of Soloway et al. (U.S. Pat. No. 6,532,212, hereinafter "Soloway") under 35 U.S.C. § 103(a).
- Whether claims 17-20, 36-39, 55-58, 74-77 and 88-91 are obvious over Valdevit in view of Soloway, and further in view of Srikanth et al. (U.S. Pat. No. 6,430,621, hereinafter "Srikanth") under 35 U.S.C. § 103(a).

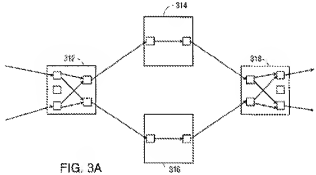
VII. ARGUMENT

The claims do not stand or fall together. Instead, Appellants present separate arguments for various independent and dependent claims. After a concise discussion of cited art, each of these arguments is separately argued below and presented with separate headings and subheading as required by 37 CFR § 41.37(c)(l)(vii).

A. Overview of Valdevit

Valdevit is directed to systems and methods for distributing traffic load through dynamic path selection in a communication network while guaranteeing in-order delivery of frames within a sequence.[47] Header information is used to categorize data frames, as each frame is received, into sequences that require in-order delivery.[48] Each sequence is associated with a path taken by all data frames within a given sequence to reach a given destination, thus preserving the order of the frames within each sequence.[49] Valdevit further teaches a Fibre Channel fabric as an example of at least part of the aforementioned communication network,[50] wherein the fabric includes one or more interconnected Fibre Channel switches.[51] Each switch uses a destination identifier included within received frames to make routing decisions, and includes routing tables that allow routes to be set up





[47] Valdevit, lines 1-5 of ¶ [0012].
[48] Valdevit, lines 5-8 of ¶ [0012].
[49] Valdevit, lines 8-12 of ¶ [0012].
[50] Valdevit, lines 1-4 of ¶ [0028]; and lines 1-2 of ¶ [0039].
[51] Valdevit, lines 1-6 of ¶ [0040] and FIG. 2.

independently per receive port, or alternatively includes a centralized routing table structure.[52]

Valdevit further teaches a dynamic path selection that is implemented within the fabric switches, such that the internal path for data flow from each port within a switch is not "hard wired" but rather consists of a set of possible paths.[53] The switches taught by Valdevit, such as those shown in FIGS. 3A and 3B (reproduced above),[54] include a plurality of ports,[55] and routing logic that functions to determine which port a particular data frame should go.[56] Based on the multiple-field routing table and the entries established at initiation of the switch, the routing logic decides (for each frame) which path to take, and thus which port to use, causing the frame to be sent through the appropriate internal data path within the switch.[57] Appellants respectfully submit that nowhere within Valdevit is there a teaching or even a suggestion that the selected route is through two switches. Valdevit instead merely teaches that the route is directed out of the selected port of the single switch itself.

B. Overview of Soloway

Soloway is directed to a method and apparatus for routing frames through a Fibre Channel fabric to make the most efficient possible use of redundant inter-switch links between neighboring switches.[58] The invention taught by Soloway is expressly described as,

> A trunking design in accordance with the present invention [that] provides a solution to the aforementioned problems by providing aggregation of links between adjacent switches in an efficient manner.[59]

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[52] Valdevit, lines 29-35 of ¶ [0040].
[53] Valdevit, lines 1-8 of ¶ [0049] and FIG. 3B. Appellants respectfully note that Valdevit includes two figures labeled "3A," and Appellants have assumed that FIG. 3B, as referenced in Valdevit, refers to the second figure (on the bottom half of the page) labeled as FIG. 3A.
[54] Valdevit, lines 12-15 of ¶ [0051].
[55] Valdevit, lines 1-12 of ¶ [0051] and FIG. 4.
[56] Valdevit, lines 9-10 of ¶ [0052] and FIG. 4.
[57] Valdevit, lines 16-22 of ¶ [0052] and FIG. 4.
[58] *See* Soloway, Abstract.
[59] Soloway, col. 1, line 66 through col. 2, line 2.

Soloway further expressly defines trunking as,

> refer[ring] generally to methods that manage the available communication bandwidth of the plurality of redundant links in aggregate, rather than individually.[60]

Additionally, Soloway teaches that,

> the trunking feature of the present invention makes efficient use of the redundant ISLs between neighboring switches 300 and 310.[61]

Soloway further presents an example in FIG. 4 (reproduced below), in which,

> Fibre Channel switch 300 is coupled to Fibre Channel switch 310 through a plurality of redundant inter-switch links (ISL's). In the illustrated example, five inter-switch links are illustrated having different data rates for transmitting traffic. As shown, ISL 330 and ISL 340 transmit traffic at a rate of 1 Gbps; ISL 350 and ISL 360 transmit at a rate of 2 Gbps; and ISL 370 transmits at a rate of 10 Gbps.[62]

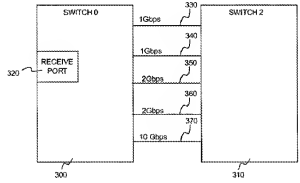

FIGURE 4

Finally, Soloway teaches that traffic is automatically distributed between all available inter-switch links that connect the two switches of FIG. 4:

> All ISLs that lead to adjacent switches on the shortest path to the flow's destination are considered when rerouting flows to that destination. For example, when the FSPF protocol determines that ISL 370 is the shortest path to switch 310, a flow may be rerouted onto ISL 330, 340, 350 or 360 since each ISL

[60] Soloway, col. 6, lines 23-26.
[61] Soloway, col. 6, lines 21-23.
[62] Soloway, col. 6, lines 10-16.

> couples switch 300 to switch 310. In other words, even if a link is not on the FSPF-determined path to a flow's destination, the flow may be routed onto the link to relieve congestion.[63]

Thus, Soloway teaches automatically trunking all available inter-switch links (ISLs) between two adjacent switches together so as to manage the aggregated ISLs as one single entity (*i.e.*, one single trunk group). The links taught by Soloway between switches 300 and 310 of FIG. 4 are clearly identified as inter-switch links, are always referred to individually as inter-switch links or ISLs throughout the text of Soloway, and are *never* referred to individually as trunks or trunking groups.

C. Overview of Srikanth

Srikanth is directed to a method and apparatus that provides for grouping nodes in multiple VLANs using port based VLAN grouping, and explicitly associates one of multiple VLANs with a packet transmitted by the nodes, using IEEE 802.1Q based frame tagging.[64] A switch receives an untagged packet, filters the packet, and based on the contents of the packet, inserts a tag header with a common VLAN identifier and a unique tag protocol identifier (TPID).[65] Srikanth additionally teaches that,

> In another example, a packet destined for node C is transmitted by node A and received at switch 305, port 2. Given that port 2 is configured to be associated with VLAN 1 in this example, a VLAN tag header is inserted in the packet with a VID=1. The switch again parses this packet using well known filtering techniques, and based on the contents of the packet, inserts a TPID value of 2 in the TPID field in the tag header at 420. At 425, the tagged packet is forwarded over the interswitch link to switch 310. In the same manner as set forth above, switch 310 receives the tagged packet, determines the TPID and VID values, and forwards the packet, stripped of the tag, to port 6 at step 430.[66]

Thus Srikanth teaches a first switch that adds a tag to a packet and transmits the modified packet to a second switch via an exit port that is selected based upon existing information within the

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[63] Soloway, col. 7, lines 35-43.
[64] *See* Srikanth, Abstract.
[65] *Id.*
[66] Srikanth, col. 5, lines 13-24, and FIG. 3.

packet (*i.e.*, the VID). The modified packet is then received by the second switch, which selects the exit port based upon the added tag, and strips the tag before forwarding the packet to the selected exit port.

D. The Rejections of Claims 1-15, 21-34, 40-53, 59-72, 78-87 and 92-95

1. The Independent Claims

In rejecting independent claim 1 as allegedly obvious over Valdevit in view of Soloway under 35 U.S.C. § 103(a), it was stated in the Final Office Action that,

> Soloway, from the same or similar field of endeavor, teaches a Fibre Channel fabric comprising Fibre Channel switches 300 and 310 (See Fig 4) and including at least two trunk groups (Fig 4, elements 330 and 340, 350 and 360) for routing flow traffic (column 2, lines 10-25 and column 6, lines 10-27).[67]

Appellants respectfully traverse the characterization of the cited art, noting that Soloway teaches combining all of the available inter-switch links into a single trunk group, and further noting that there is no teaching or suggestion whatsoever within Soloway of the ISL grouping proposed in the Final Office Action, or any grouping other than a single trunk group that includes all available ISLs between two switches.

As already noted, Soloway teaches a trunking design in which all available inter-switch links between two switches are considered when rerouting a flow through the switches. Indeed, the very purpose of the invention taught by Soloway is to eliminate the need for the manual configuration of trunk groups by **automatically** balancing traffic across **all** available ISLs between the switches. More specifically,

> Load-balancing among ISLs 330, 340, 350, 360 and 370 in accordance with the present invention requires no configuration by the user, other than enabling the trunking aspect of the present invention. In particular, **there is no need to manually configure the ISLs of FIG. 4 into "trunk groups" of redundant links** that can offload each other. Instead, **candidate links for rerouting of a flow are identified automatically** from a topology database maintained by the

[67] Final Office Action ¶ 3, p. 4. Appellants note that these same arguments were restated, without further elaboration, in the Advisory Action.

> FSPF protocol. **All** ISLs that lead to adjacent switches on the shortest path to the flow's destination **are considered when rerouting flows to that destination**.[68]

Thus, by automatically performing load balancing across all available ISLs as described, the invention taught by Soloway operates to "manage the available communication bandwidth of the plurality of redundant links **in aggregate, rather than individually**."[69] This is the very definition of trunking (as defined by Soloway), and is described by Soloway as the "trunking feature of the present invention."[70] Because traffic is balanced across **all** available ISLs identified as candidate links, only **one** trunk group is defined that includes these ISLs. Nothing in Soloway teaches or even suggests that any of the ISLs are or should be segregated into multiple distinct trunk groups. Indeed, by teaching the automatic trunking of ISLs into a single trunk group as an alternative to manually configuring "trunk group**s**" (plural), Appellants submit that Soloway teaches *away* from the use of multiple trunk groups. More importantly, Soloway does not teach, suggest or even mention balancing traffic *across* at least two trunk groups, as required by independent claim 1, only across multiple ISLs *within* a single trunk group.

At least because Soloway does not teach or even suggest selecting an exit port from a set of possible exit ports that includes at least some of the exit ports of at least two trunk groups, as required by independent claim 1, Appellants respectfully submit that none of the cited art, either alone or together, teach or suggest all of the limitations of the claim. Appellants thus respectfully submit that the Examiner erred in rejecting independent claim 1 as obvious over Valdevit in view of Soloway, and respectfully request reversal of the rejection of the claim under 35 U.S.C. § 103(a).

With regard to independent claims 21, 40, 59, 78 and 92, Appellants note that each of these claims includes limitations similar to those of independent claim 1. Therefore, for at least the same reasons as presented above, Appellants respectfully submit that the Examiner also erred in rejecting independent claims 21, 40, 59, 78 and 92 as obvious over Valdevit in view of

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[68] Soloway, col. 7, lines 26-37 (emphasis added).
[69] Soloway, col. 6, lines 24-26 (emphasis added).
[70] Soloway, col. 6, line 22-23.

Soloway, and respectfully request reversal of the rejections of these claims under 35 U.S.C. § 103(a).

Appellants further note that it was stated in both the Final Office Action and the Advisory Action that, "applicant's disclosure only calls for one trunking group."[71] Appellants note that the title, abstract, detailed description and claims as originally filed all repeatedly refer to "trunking group**s**" (plural) or "at least two trunking groups."[72] In any event, Appellants note for the record that this allegation is irrelevant. Only what the **claims** require is relevant, and each and every independent claim (and thus each and every dependent claim), **as originally and currently submitted**, requires "**at least two** trunking groups," which (as already shown) is a claim element not taught or even suggested by any of the cited art, either alone or together.

2. Dependent Claims 2-15, 22-34, 41-53, 60-72, 79-87 and 93-95

Appellants note that Dependent claims 2-15, 22-34, 41-53, 60-72, 79-87 and 93-95 were rejected as allegedly obvious over Valdevit in view of Soloway. Appellants respectfully submit that because these claims each depend upon one of the Independent Claims, these dependent claims are each not rendered obvious by the cited art for at least the same reasons as those presented above with regard to independent claims 1, 21, 40, 59, 78 and 92. Appellants therefore respectfully submit that the Examiner erred in rejecting claims 2-15, 22-34, 41-53, 60-72, 79-87 and 93-95 as obvious over Valdevit in view of Soloway, and respectfully request reversal of the rejections of these claims under 35 U.S.C. § 103(a).

i. Dependent Claim 2

Appellants additionally note that in rejecting dependent claim 2, it was alleged in the Final Office Action that "Valdevit discloses at least all of the exit ports of at least two trunk

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[71] Final Office Action, ¶ 2, p. 2, and Advisory Action, p. 2.

[72] *See, e.g.*, Specification, Title ("Frame Traffic Balancing Across **Trunk Groups**"); Abstract ("Embodiments of methods, apparatuses and/or systems for balancing flow across **trunk groups** are discussed."); ¶ [0045] ("…it may be desirable to have the capability to balance frame traffic across or between **at least two trunked groups**, regardless of the size of the particular trunked groups themselves."); ¶ [0046] ("In addition, the set of possible exit ports may include at least some of the exit ports of **at least two trunked groups**."); and claims 1, 2, 21, 40, 59, 78 and 92 (emphasis added).

groups (Fig 8A, elements 812 and 818)."[73] Appellants note that it was acknowledged in the Final Office Action that Valdevit fails to disclose a switch fabric that comprises at least two trunk groups.[74] Appellants thus respectfully submit that it is not possible for Valdevit to disclose at least all of the exit ports of at least two trunk groups, given that Valdevit does not disclose the at least two trunk groups that are required by the claim element to include all of the exit ports.

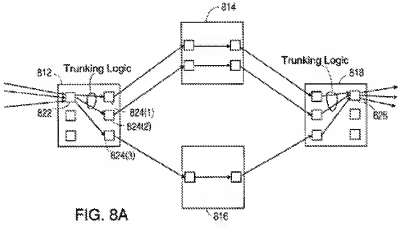

FIG. 8A

Further, element (switch) 812 in FIG. 8A of Valdevit (shown above) only includes a single egress trunk group (comprising egress ports 824(1) and 824(2)). Similarly, element (switch) 818 includes a single trunk group with multiple ingress ports, but only includes a single egress port (port 828). Appellants note that the full text of claim 2 requires "wherein said set of possible exit ports includes at least all of the exit ports of at least two trunk groups." Appellants further note that claim 1 (upon which claim 2 depends) requires that the set of possible exit ports are all included within a single switch ("applying a process to select an exit port of said switch from a set of possible exit ports") (emphasis added). Appellants thus respectfully submit that the at least two trunk groups required by dependent claim 2 must be included within a single switch, and this configuration is not taught or even suggested by Valdevit.

For at least these reasons, and in addition to the reasons already presented, Appellants again respectfully submit that none of the cited art, either alone or together, suggests all of the

[73] Final Office Action, ¶ 3, p. 5.
[74] *See* Final Office Action, ¶ 3, p. 4 ("For claims 1, 21, 40, 59, 78, and 92, Valdevit discloses the entire claimed invention **except for the switch fabric comprises at least two trunk groups**.") (emphasis added).

elements of dependent claim 2, and thus none of the cited art renders the claim obvious. Appellants further note that dependent claim 2 includes limitations similar to dependent claim 17, and is also not rendered obvious for the reasons explained below in section VII-E-5 (Additional Arguments). Appellants therefore respectfully submit that the Examiner erred in rejecting the claim, and respectfully request reversal of the rejection of dependent claim 2 under 35 U.S.C. § 103(a).

E. The Rejections of Claims 17-20, 36-39, 55-58, 74-77 and 88-91

Appellants note that Dependent claims 17-20, 36-39, 55-58, 74-77 and 88-91 were rejected as allegedly obvious over Valdevit in view of Soloway, and further in view of Srikanth. Appellants respectfully submit that because these claims each depend upon one of the Independent Claims, these dependent claims are each not rendered obvious by the cited art for at least the same reasons as those presented above with regard to independent claims 1, 21, 40, 59, 78 and 92. Appellants therefore respectfully submit that the Examiner erred in rejecting claims 17-20, 36-39, 55-58, 74-77 and 88-91 as obvious over Valdevit in view of Soloway, and further in view of Srikanth, and respectfully request reversal of the rejections of these claims.

1. Dependent Claims 17, 36, 55, 74 and 88

Appellants further note that in rejecting dependent claims 17, 36, 55, 74 and 88, it was stated in the Final Office Action that "Valdevit and Soloway disclose the entire claimed invention except for at least one of the set of possible exit ports is selected based at least in part on a source tag or destination tag added to the frame after the frame enters the switch,"[75] and further alleged that "Srikanth, from the same or similar field of endeavor, teaches selecting exit ports for packet forwarding based on a source or destination tag (column 5, lines 3-29)."[76] Appellants respectfully traverse both the characterization of the claims and the characterization of the cited art, noting that the claims each requires that the addition of the tags and the selection of the exit port both be performed within a single switch, and further noting that the tag addition

[75] Final Office Action, ¶ 4, p. 6.
[76] Final Office Action, ¶ 4, p. 6.

taught by Srikanth is performed by one switch while the exit port selection taught is performed by another switch.

More specifically, dependent claim 36 (which is representative of all the claims referenced in this rejection) requires "wherein **said first switch selects** at least one of said set of possible exit ports based at least in part on a source tag and/or a destination tag added to said at least one frame **after** said at least one frame **enters said switch**" (emphasis added). Thus, claim 36 requires that the tag be added after entering the same switch that performs the selection of the exit port. By contrast, as already noted, Srikanth teaches **two** switches, wherein a first switch adds a tag to a packet and transmits the packet **with** the added tag to a second switch via an exit port that is selected based upon existing information within the packet, **not** based upon the added tag. The modified packet is then received by the second switch with the tag **already added**, which selects the exit port based upon the added tag, and strips the tag before forwarding the packet to the selected exit port.

Appellants also note that applying the adding and stripping of tags taught by Srikanth to the switches taught by Valdevit and Soloway, with the intent of producing the single switch required by claim 36, would render the invention taught by Srikanth unsuitable for its intended purpose, thus negating any motivation or suggestion to combine the two references.[77] Specifically, the invention taught by Srikanth is directed to "[a] method and apparatus that provides for grouping nodes in multiple VLANs using port based VLAN grouping, and explicitly associates one of multiple VLANs with a packet transmitted by the nodes, using IEEE 802.1Q based frame tagging."[78] Srikanth further asserts that "VLANs define groups of nodes in the switched network that are not constrained by the physical location of the nodes."[79] Appellants respectfully submit that to apply the tag addition/stripping of Srikanth to a single switch would constrain the nodes of the network to the physical location of that single switch, thus making the resulting switch unsuitable for use with the multiple virtual local area networks (VLANs) to

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[77] *See* MPEP 2143.01-V (citing *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984)) ("If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification.").
[78] Srikanth, abstract.
[79] Srikanth, col. 1, lines 17-18.

which the invention of Srikanth is directed. Thus, because the resulting switch would be unsuitable for the intended purpose of the invention taught by Srikanth, Appellants respectfully submit that there is no motivation to combine Srikanth with Valdevit and Soloway.

At least because Srikanth teaches two switches wherein one adds the tag and the other selects the port based on the added tag, Appellants respectfully submit that Srikanth does not teach or even suggest a single switch that selects one of a set of possible exit ports based at least in part on a tag added to a frame after being received by said single switch, as required by dependent claim 36 (and the other similarly rejected claims). Further, none of the cited art overcomes the deficiencies of Srikanth. For at least these reasons, and in addition to the reasons already presented above, Appellants therefore respectfully submit that none of the cited art, either alone or together, teaches or suggests all of the limitations of dependent claims 17, 36, 55, 74 and 88. Additionally, at least for the reasons presented above, Appellants also respectfully submit that there is no motivation to combine Srikanth with Valdevit and Soloway. Appellants thus respectfully submit that these claims are not rendered obvious by the cited art and that the Examiner erred in rejecting the claims, and respectfully request reversal of the rejection of dependent claims 17, 36, 55, 74 and 88 under 35 U.S.C. § 103(a).

2. Dependent Claims 18, 37, 56, 75 and 89

Appellants additionally note that in rejecting dependent claims 18, 37, 56, 75 and 89, it was stated in the Final Office Action that "[Srikanth][80] discloses the source tag or destination ta[g] is stripped off the frame before the frame exits the switch (column 5, lines 3-29 wherein the tag is stripped off before forwarding the packet to the selected port)."[81] Appellants respectfully traverse both the characterization of the claims and the characterization of the cited art, noting that the each of the rejected claims requires that the switch that performs the required stripping of

[80] Appellants respectfully note that the Final Office Action actually cites Valdevit, but based upon the citation and the context of the rejections Appellants believe this was a typographical error, and the present response assumes that the Examiner intended to cite Srikanth.
[81] Final Office Action, ¶ 4, p. 6.

the tag be the same switch that adds the tag, and further noting that the Srikanth teaches two separate switches that each performs only one of these functions.

More specifically, dependent claim 37 (which is representative of all the claims referenced in this rejection) requires "wherein **said first switch** strips said source tag and/or said destination tag off said at least one frame before said at least one frame exits said switch" (emphasis added). Because claim 37 depends upon claim 36 (discussed above), "said first switch" is the same first switch of claim 36, which requires adding the tag after the switch receives the frame. As already noted in the discussion of dependent claim 36, Srikanth, in contrast, teaches two switches wherein a first switch adds the tag, but a second switch strips the tag.[82] Appellants thus respectfully submit that Srikanth does not teach or even suggest a single switch that both adds a tag to a received frame and later strips the added tag before forwarding the frame to a selected exit port, as required by dependent claim 37 (as well as the other similarly rejected claims). Further, none of the cited art overcomes these deficiencies of Srikanth.

For at least these reasons, and in addition to the reasons already presented above, Appellants therefore respectfully submit that none of the cited art, either alone or together, teaches or suggests all of the limitations of dependent claims 18, 37, 56, 75 and 89. Additionally, at least for the same reasons as those presented above with regard to dependent claim 36, Appellants also respectfully submit that there is no motivation to combine Srikanth with Valdevit and Soloway. Appellants thus respectfully submit that these claims are not rendered obvious by the cited art and that the Examiner erred in rejecting the claims, and respectfully request reversal of the rejection of dependent claims 18, 37, 56, 75 and 89 under 35 U.S.C. § 103(a).

3. Dependent Claims 19, 38, 57, 76 and 90

Appellants note that dependent claims 19, 38, 57, 76 and 90 include limitations respectively similar to dependent claims 17, 36, 55, 74 and 88, and were rejected on similar

[82] *See* Srikanth, col. 5, lines 13-24, and FIG. 3

grounds.[83] Thus, for at least the same additional reasons presented above with regard to dependent claims 17, 36, 55, 74 and 88, dependent claims 19, 38, 57, 76 and 90 are also not rendered obvious by the cited art. Appellants therefore again respectfully submit that the Examiner erred in rejecting dependent claims 19, 38, 57, 76 and 90, and respectfully request reversal of the rejection of these dependent claims under 35 U.S.C. § 103(a).

4. Dependent Claims 20, 39, 58, 77 and 91

Appellants note that dependent claims 20, 39, 58, 77 and 91 include limitations respectively similar to dependent claims 17, 36, 55, 74 and 88, and were rejected on similar grounds.[84] Thus, for at least the same additional reasons presented above with regard to dependent claims 17, 36, 55, 74 and 88, dependent claims 20, 39, 58, 77 and 91 are also not rendered obvious by the cited art. Appellants therefore again respectfully submit that the Examiner erred in rejecting dependent claims 20, 39, 58, 77 and 91, and respectfully request reversal of the rejection of these dependent claims under 35 U.S.C. § 103(a).

5. Additional Arguments

Appellants further note that in responding to the arguments presented in Appellants' Prior Response of September 25, 2008 (hereinafter "Prior Response"), the Final Office Action and the Advisory Action both only addressed claims 36 and 37, alleging that these claims are representative of all the dependent claims, and further alleging that "the claims as written do not specific whether the tag is being 'added by the switch' or whether the tag is being 'stripped by the same switch'."[85] Appellants respectfully traverse this characterization of the dependent claims, noting that claims 36 and 37 are not representative of all the remaining dependent claims, and that at least some of the remaining dependent claims **expressly** require that several of the operations and elements required by the claims be performed by, or included within, a single switch.

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[83] *See* Final Office Action, ¶ 4, p. 7.
[84] *Id.*
[85] *See* Final Office Action, ¶ 2, p. 2; *see also* Advisory Action, p. 2

More specifically, and using dependent claim 17 as a representative example, independent claim 1 (upon which claim 17 depends) requires,

> A method of routing a flow of frames through **a switch** comprising:... applying a process **to select an exit port of said switch** from a set of possible exit ports...,[86]

and dependent claim 17 requires,

> wherein at least one of said set of possible exit ports is selected based at least in part on a source tag and/or a destination tag added to said at least one frame **after said at least one frame enters said switch**.[87]

Appellants note that it is a fundamental principal of claim construction that a claim element first referenced with "a" or "an," and subsequently referenced with "the" or "said," **is the same claim element**. Thus, given that the selected exit port is "of said switch," and that the source/destination tag is added after the at least one frame "enters said switch," "said switch" is, as a matter of basic claim construction, the same single switch referenced throughout the claim. Therefore, dependent claim 17, **by the express language of the claim itself**, **requires** that the addition of the required tag be performed after the at least one frame enters **the same single switch required by the claim** that includes the selected exit port, and which thus **must** logically perform the selection, since the tag used as a basis to select the exit port is added after entering the switch, but before the frame exits the switch since the switch's exit port must first be selected. Other dependent claims (*e.g.*, dependent claim 55) more expressly require that "said switch" perform the selection of the exit port.

From the above it is clear that all operations or elements required by the claims to be performed by, or included in, "said switch" are performed by, and included within, the same single switch. For at least these reasons, Appellants respectfully submit that dependent claims 17-20, 36-39, 55-58, 74-77 and 88-91 all require that at least some of the claimed operations be performed by, and at least some of the claimed elements be included within, a single switch, and further submit that such operations and elements that are required to be within a single switch are not taught by any of the art cited, either alone or together. Appellants therefore again

[86] Emphasis added.
[87] Emphasis added.

respectfully submit that dependent claims 17-20, 36-39, 55-58, 74-77 and 88-91 are not rendered obvious by any of the art cited, that the Examiner erred in rejecting the claims, and respectfully request reversal of the rejection of these dependent claims under 35 U.S.C. § 103(a).[88]

F. Conclusion

For the reasons stated above, Appellants respectfully submit that the Examiner erred in rejecting claims 1-22 and 24-43, and respectfully request reversal of the rejections of these claims. Appellants believe that no extensions of time or fees are required, beyond those that may otherwise be provided in documents accompanying this response. Nonetheless, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fees required (including fees for net addition of claims) are hereby authorized to be charged to Wong Cabello's Deposit Account No. 50-1922, referencing docket number 112-0135US.

Respectfully submitted,

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Filed Electronically

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[88] As previously noted, these arguments also apply to dependent claim 2.

VIII. CLAIMS APPENDIX

1. (Previously Presented) A method of routing a flow of frames through a switch comprising:

receiving at least one frame from said flow of frames;

applying a process to select an exit port of said switch from a set of possible exit ports through which at least one frame from said flow of frames will exit to potentially reduce frame traffic congestion along potential routes that include said set of possible exit ports, said set of possible exit ports including at least some of the exit ports of at least two trunk groups; and

transmitting said at least one frame.

2. (Original) The method of claim 1, wherein said set of possible exit ports includes at least all of the exit ports of at least two trunk groups.

3. (Original) The method of claim 1, wherein at least one of said trunk groups comprises four exit ports.

4. (Original) The method of claim 1, wherein at least one of said trunk groups comprises eight exit ports.

5. (Original) The method of claim 1, wherein said process comprises a pseudo-random process.

6. (Original) The method of claim 5, wherein applying said pseudo-random process comprises applying a hash function.

7. (Original) The method of claim 6, wherein said hash function is applied to a set of parameters associated with the frames exiting said switch in order to select an exit port from said set of possible exit ports.

8. (Previously Presented) The method of claim 1, wherein a weight is respectively assigned to at least some respective ones of said exit ports; and

wherein applying a process to select an exit port of said switch from a set of possible exit ports through which a frame from said flow of frames will exit to potentially reduce frame traffic congestion along potential routes that include said set of possible exit ports comprises employing the weights to select an exit port that is as good as or better than alternative exit ports in terms of achieving an objective function reflected by said weights.

9. (Original) The method of claim 8, wherein as good as or better in terms of achieving an objective function comprises obtaining a higher value objective function.

10. (Original) The method of claim 8, wherein as good as or better in terms of achieving an objective function comprises obtaining a lower value objective function.

11. (Original) The method of claim 8, wherein said weights at least in part reflect consumed bandwidth for particular routes.

12. (Previously Presented) The method of claim 8, wherein at least some exit ports have multiple weights reflecting routes from the particular exit port to multiple respective destination ports; and

wherein applying a process to select an exit port from a set of possible exit ports through which a frame from said flow of frames will exit to potentially reduce frame traffic congestion along potential routes that include said set of possible exit ports comprises employing said multiple weights to select an exit port that is as good as or better than alternative exit ports in terms of achieving an objective reflected by said weights.

13. (Original) The method of claim 12, wherein as good as or better in terms of achieving an objective function comprises obtaining a higher value objective function.

14. (Original) The method of claim 12, wherein as good as or better in terms of achieving an objective function comprises obtaining a lower value objective function.

15. (Original) The method of claim 12, wherein said multiple weights at least in part reflect consumed bandwidth for particular routes.

16. (Cancelled)

17. (Previously Presented) The method of claim 1, wherein at least one of said set of possible exit ports is selected based at least in part on a source tag and/or a destination tag added to said at least one frame after said at least one frame enters said switch.

18. (Previously Presented) The method of claim 17, wherein said source tag and/or said destination tag is stripped off said at least one frame before said at least one frame exits said switch.

19. (Previously Presented) The method of claim 1, wherein at least one of said set of possible exit ports is selected based at least in part on a source tag and/or a destination tag added to each of said at least one frames after said at least one frames enter said switch.

20. (Previously Presented) The method of claim 19, wherein said source tag and/or said destination tag is stripped off each of said at least one frames before each of said at least one frames exits said switch.

21. (Previously Presented) A switch fabric comprising:

at least a first switch and a second switch;

said first and said second switch being communicatively coupled;

said first switch including a processor and a memory, and balancing a flow of frames exiting said first switch; and

said first switch selecting an exit port of said first switch from a set of possible exit ports through which a frame from said flow of frames will exit to potentially reduce frame traffic congestion along potential routes that include said set of possible exit ports, said set of possible exit ports including at least some of the exit ports of at least two trunk groups.

22. (Original) The switch fabric of claim 21, wherein at least one of said trunk groups comprises four exit ports.

23. (Original) The switch fabric of claim 21, wherein at least one of said trunk groups comprises eight exit ports.

24. (Previously Presented) The switch fabric of claim 21, wherein said first switch selects said exit port pseudo-randomly.

25. (Previously Presented) The switch fabric of claim 24, wherein said first switch selects said exit port pseudo-randomly by applying a hash function.

26. (Previously Presented) The switch fabric of claim 25, wherein said first switch applies said hash function to a set of parameters associated with the frames that will exit said first switch.

27. (Previously Presented) The switch fabric of claim 21, wherein said first switch is adapted to respectively assign a weight to at least some respective ones of said exit ports; and

wherein said first switch is adapted to employ the weights to select an exit port for a frame of said flow of frames to exit to balance said flow of frames exiting said first switch so that said selected exit port is as good as or better than alternative exit ports in terms of achieving an objective reflected by said weights.

28. (Original) The switch fabric of claim 27, wherein as good as or better in terms of achieving an objective function comprises obtaining a higher value objective function.

29. (Original) The switch fabric of claim 27, wherein as good as or better in terms of achieving an objective function comprises obtaining a lower value objective function.

30. (Previously Presented) The switch fabric of claim 27, wherein said weights at least in part reflect consumed bandwidth for particular routes.

31. (Previously Presented) The switch fabric of claim 27, wherein at least some exit ports have multiple weights to reflect routes from the particular exit port to multiple respective destination ports; and

wherein said first switch employs said multiple weights to select an exit port for a frame of said flow of frames to exit to balance said flow of frames exiting said first switch to select an exit port that is as good as or better than alternative exit ports in terms of achieving an objective reflected by said weights.

32. (Previously Presented) The switch fabric of claim 31, wherein said multiple weights at least in part reflect consumed bandwidth for particular routes.

33. (Original) The switch fabric of claim 31, wherein as good as or better in terms of achieving an objective function comprises obtaining a higher value objective function.

34. (Original) The switch fabric of claim 31, wherein as good as or better in terms of achieving an objective function comprises obtaining a lower value objective function.

35. (Cancelled)

36. (Previously Presented) The switch fabric of claim 21, wherein said first switch selects at least one of said set of possible exit ports based at least in part on a source tag and/or a destination tag added to said at least one frame after said at least one frame enters said first switch.

37. (Previously Presented) The switch fabric of claim 36, wherein said first switch strips said source tag and/or said destination tag off said at least one frame before said at least one frame exits said first switch.

38. (Previously Presented) The switch fabric of claim 21, wherein said first switch selects at least one of said set of possible exit ports based at least in part on a source tag and/or a

destination tag added to each of said at least one frames after said at least one frames enter said first switch.

39. (Previously Presented) The switch fabric of claim 38, wherein said first switch strips said source tag and/or said destination tag off each of said at least one frames before each of said at least one frames exits said first switch.

40. (Previously Presented) An apparatus comprising:

a switch, said switch including a processor and a memory;

said switch further balancing a flow of frames exiting said switch; and

said switch selecting an exit port of said switch from a set of possible exit ports through which a frame from said flow of frames will exit to potentially reduce frame traffic congestion along potential routes that include said set of possible exit ports, said set of possible exit ports including at least some of the exit ports of at least two trunk groups.

41. (Original) The apparatus of claim 40, wherein at least one of said trunk groups comprises four exit ports.

42. (Original) The apparatus of claim 40, wherein at least one of said trunk groups comprises eight exit ports.

43. (Previously Presented) The apparatus of claim 40, wherein said switch selects said exit port pseudo-randomly.

44. (Previously Presented) The apparatus of claim 43, wherein said switch selects said exit port pseudo-randomly by applying a hash function.

45. (Previously Presented) The apparatus of claim 44, wherein said switch applies said hash function to a set of parameters associated with the frames that will exit said switch.

46. (Previously Presented) The apparatus of claim 40, wherein said switch respectively assigns a weight to at least some respective ones of said exit ports; and

wherein said switch employs the weights to select an exit port for a frame of said flow of frames to exit to balance said flow of frames exiting said switch so that said selected exit port is as good as or better than alternative exit ports in terms of achieving an objective reflected by said weights.

47. (Original) The apparatus of claim 46, wherein as good as or better in terms of achieving an objective function comprises obtaining a lower value objective function.

48. (Original) The apparatus of claim 46, wherein as good as or better in terms of achieving an objective function comprises obtaining a higher value objective function.

49. (Original) The apparatus of claim 46, wherein said weights at least in part reflect consumed bandwidth for particular routes.

50. (Previously Presented) The apparatus of claim 46, wherein at least some exit ports have multiple weights to reflect routes from the particular exit port to multiple respective destination ports; and

wherein said switch employs said multiple weights to select an exit port for a frame of said flow of frames to exit to balance said flow of frames exiting said switch to select an exit port that is as good as or better than alternative exit ports in terms of achieving an objective reflected by said weights.

51. (Original) The apparatus of claim 50, wherein as good as or better in terms of achieving an objective function comprises obtaining a lower value objective function.

52. (Original) The apparatus of claim 50, wherein as good as or better in terms of achieving an objective function comprises obtaining a higher value objective function.

53. (Original) The apparatus of claim 50, wherein said multiple weights at least in part reflect consumed bandwidth for particular routes.

54. (Cancelled)

55. (Previously Presented) The apparatus of claim 41, wherein said switch selects at least one of said set of possible exit ports based at least in part on a source tag and/or a destination tag added to said at least one frame after said at least one frame enters said switch.

56. (Previously Presented) The apparatus of claim 55, wherein said switch strips said source tag and/or said destination tag off said at least one frame before said at least one frame exits said switch.

57. (Previously Presented) The apparatus of claim 40, wherein said switch selects at least one of said set of possible exit ports based at least in part on a source tag and/or a destination tag added to each of said at least one frames after said at least one frames enter said switch.

58. (Previously Presented) The apparatus of claim 57, wherein said switch strips said source tag and/or said destination tag off each of said at least one frames before each of said at least one frames exits said switch.

59. (Previously Presented) A network comprising:

a host;

a physical storage unit; and

a first switch and a second switch communicatively coupled to form a switch fabric;

said first switch and said second switch further communicatively coupled to said host and said physical storage unit;

at least said first switch including a processor and memory, and balancing a flow of frames exiting said first switch; and

said first switch selecting an exit port of said first switch from a set of possible exit ports through which a frame from said flow of frames will exit to potentially reduce frame traffic congestion along potential routes that include said set of possible exit ports, said set of possible exit ports including at least some of the exit ports of at least two trunk groups.

60. (Original) The network of claim 59, wherein at least one of said trunk groups comprises four exit ports.

61. (Original) The network of claim 59, wherein at least one of said trunk groups comprises eight exit ports.

62. (Previously Presented) The network of claim 59, wherein said first switch selects said exit port pseudo-randomly.

63. (Previously Presented) The network of claim 62, wherein said first switch selects said exit port pseudo-randomly by applying a hash function.

64. (Previously Presented) The network of claim 63, wherein said first switch applies said hash function to a set of parameters associated with the frames that will exit said first switch.

65. (Previously Presented) The network of claim 59, wherein said first switch is adapted to respectively assign a weight to at least some respective ones of said exit ports; and

wherein said first switch employs the weights to select an exit port for a frame of said flow of frames to exit to balance said flow of frames exiting said first switch so that said selected exit port is as good as or better than alternative exit ports in terms of achieving an objective reflected by said weights.

66. (Original) The network of claim 65, wherein as good as or better in terms of achieving an objective function comprises obtaining a lower value objective function.

67. (Original) The network of claim 65, wherein as good as or better in terms of achieving an objective function comprises obtaining a higher value objective function.

68. (Original) The network of claim 65, wherein said weights at least in part reflect consumed bandwidth for particular routes.

69. (Previously Presented) The network of claim 65, wherein at least some exit ports have multiple weights to reflect routes from the particular exit port to multiple respective destination ports; and

wherein said first switch employs said multiple weights to select an exit port for a frame of said flow of frames to exit to balance said flow of frames exiting said first switch to select an exit port that is as good as or better than alternative exit ports in terms of achieving an objective reflected by said weights.

70. (Original) The network of claim 69, wherein as good as or better in terms of achieving an objective function comprises obtaining a lower value objective function.

71. (Original) The network of claim 69, wherein as good as or better in terms of achieving an objective function comprises obtaining a higher value objective function.

72. (Original) The network of claim 69, wherein said multiple weights at least in part reflect consumed bandwidth for particular routes.

73. (Cancelled)

74. (Previously Presented) The network of claim 59, wherein said first switch selects at least one of said set of possible exit ports based at least in part on a source tag and/or a destination tag added to said at least one frame after said at least one frame enters said first switch.

75. (Previously Presented) The network of claim 74, wherein said first switch strips said source tag and/or said destination tag off said at least one frame before said at least one frame exits said first switch.

76. (Previously Presented) The network of claim 59, wherein said first switch selects at least one of said set of possible exit ports based at least in part on a source tag and/or a destination tag added to each of said at least one frames after said at least one frames enter said first switch.

77. (Previously Presented) The network of claim 76, wherein said first switch strips said source tag and/or said destination tag off each of said at least one frames before each of said at least one frames exits said first switch.

78. (Previously Presented) A computer-readable storage medium having stored thereon computer-executable instructions that, when executed, result in performance of a method of balancing a flow of frames exiting a switch that includes the following:

applying a process to select an exit port of said switch from a set of possible exit ports through which a frame from said flow of frames will exit to potentially reduce frame traffic congestion along potential routes that include said set of possible exit ports, said set of possible exit ports including at least some of the exit ports of at least two trunk groups.

79. (Previously Presented) The computer-readable storage medium of claim 78, wherein at least one of said trunk groups comprises four exit ports.

80. (Previously Presented) The computer-readable storage medium of claim 78, wherein at least one of said trunk groups comprises eight exit ports.

81. (Previously Presented) The computer-readable storage medium of claim 78, wherein said instructions, when executed, further result in: said process comprising a pseudo-random process.

82. (Previously Presented) The computer-readable storage medium of claim 81, wherein said instructions, when executed, further result in: said applying said pseudo-random process comprises applying a hash function.

83. (Previously Presented) The computer-readable storage medium of claim 82, wherein said instructions, when executed, further result in: said hash function being applied to a set of parameters associated with the frames exiting said switch.

84. (Previously Presented) The computer-readable storage medium of claim 78, wherein said instructions, when executed, further result in: a weight being respectively assigned to at least some respective ones of said exit ports; and further result in: applying a process to select an exit port for a frame of said flow of frames to exit to balance said flow of frames exiting said switch comprising employing the weights to select an exit port that is as good as or better than alternative exit ports in terms of achieving an objective reflected by said weights.

85. (Previously Presented) The computer-readable storage medium of claim 84, wherein said instructions, when executed, further result in: said weights at least in part reflecting consumed bandwidth for particular routes.

86. (Previously Presented) The computer-readable storage medium of claim 84, wherein said instructions, when executed, further result in: at least some exit ports having multiple weights reflecting routes from the particular exit port to multiple respective destination ports; and further result in: applying a process to select an exit port for a frame of said flow of frames to exit to balance said flow of frames exiting said switch comprising employing said multiple weights to select an exit port that is as good as or better than alternative exit ports in terms of achieving an objective reflected by said weights.

87. (Previously Presented) The computer-readable storage medium of claim 86, wherein said instructions, when executed, further resulting in: multiple weights at least in part reflecting consumed bandwidth for particular routes.

88. (Previously Presented) The computer-readable storage medium of claim 78, wherein said instructions, where further executed, result in: at least one of said set of possible exit ports being selected based at least in part on a source tag and/or a destination tag added to said at least one frame after said at least one frame enters said switch.

89. (Previously Presented) The computer-readable storage medium of claim 88, wherein said instructions, when further executed, result in: said source tag and/or said destination tag being stripped off said at least one frame before said at least one frame exits said switch.

90. (Previously Presented) The computer-readable storage medium of claim 78, wherein said instructions, when further executed, result in: at least one of said set of possible exit ports being selected based at least in part on a source tag and/or a destination tag added to each of said at least one frames after said at least one frames enter said switch.

91. (Previously Presented) The computer-readable storage medium of claim 90, wherein said instructions, when further executed, result in: said source tag and/or said destination tag being stripped off each of said at least one frames before each of said at least one frames exits said switch.

92. (Previously Presented) A computer-readable storage medium having stored thereon computer-executable instructions that, when executed, result of a method of initializing a switch to route a flow of frames comprising:

initializing said switch to apply a process to select an exit port of said switch from a set of possible exit ports through which a frame from said flow of frames will exit to potentially reduce frame traffic congestion along potential routes that include said set of possible exit ports, said set of possible exit ports including at least some of the exit ports of at least two trunk groups.

93. (Previously Presented) The computer-readable storage medium of claim 92, wherein said instructions, when executed, further result in: said switch being initialized to apply a pseudo-random process.

94. (Previously Presented) The computer-readable storage medium of claim 93, wherein said instructions, when executed, further result in: said switch being initialized to apply a hash function being to a set of parameters associated with frames exiting said switch.

95. (Previously Presented) The computer-readable storage medium of claim 92, wherein said instructions, when executed, further result in: said switch being initialized to assign a weight to at least some respective ones of said exit ports; and said switch being initialized to apply a process to select an exit port for a frame of said flow of frames to exit to balance said flow of frames exiting said switch comprising employing the weights to select an exit port that is as good as or better than alternative exit ports in terms of achieving an objective reflected by said weights.

IX. EVIDENCE APPENDIX

None.

X. RELATED PROCEEDINGS APPENDIX

None.